System Specification

Test Application Script Pathfinder, Thor DP1

Checkout and Launch Control System (CLCS)

84K00302-019

Test Application Script
Pathfinder Assessment

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Version 1.3

Test Application Script Pathfinder
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1. Introduction

1.1 Test Application Script Pathfinder Overview.

The purpose of this pathfinder is to provide the initial Test Application Script (TAS) function design. The TAS function provides a capability to define a sequence of events required for a given test. TAS are implemented in a manner that is clearly understandable and usable by system engineering and test management personnel and analogous to printed test procedures.

1.2 Test Application Script Pathfinder Concept

The TAS source file is created or edited using the TAS editor. The resulting source file is compiled into interpretive codes and are stored in the CM Repository (RAZOR) and integrated into the TCID as part of the Test Build activity.

At system load time, the TAS code files are loaded onto the CCP's local hard drive for executing and the CCWS's local hard drive for viewing and control.

When the operator selects a TAS to run from the CCWS, the TAS appears in a TAS viewer and begins execution in the CCP, under Test Management or System Engineering control. The TAS then runs under the direction of the TAS Viewers (step, hold, terminate, skip steps, etc.) controlling other TAS and the end item managers and/or components as specified in the TAS. The TAS prompts the operator for any variable data required to modify the TAS operation.

For manual User Class operations, the TAS prompts operators of user classes at the CCWS that control the User Class to perform the tasks and verify when complete. The TAS uses Constraint Management to monitor and notify of exception events and performs the steps to resolve the condition by performing specified steps in the TAS, another TAS or requesting EIMs to perform required operations.

The Pathfinder concept is based on review of the thread requirements and the meetings with the customer and system users. In those meetings the following criteria was gleaned to augment the thread requirements:

1. Do develop a command sequencer with limited conditional logic capability. This capability has been provided in the Command CSCI THOR thread design.
2. Do not develop a new computer language or utilize an existing one that would require:
    a. The TAS developer to have a detailed knowledge of a particular computer language syntax or computer programming methods and practices.
    b. A staff of computer programmers to develop, test, and maintain the TASs.
3. Do not develop "sequencers", which the users are already developing with ControlShell and TCL.
4. Do not develop a tool that permits users to circumvent the safety logic built into the system.

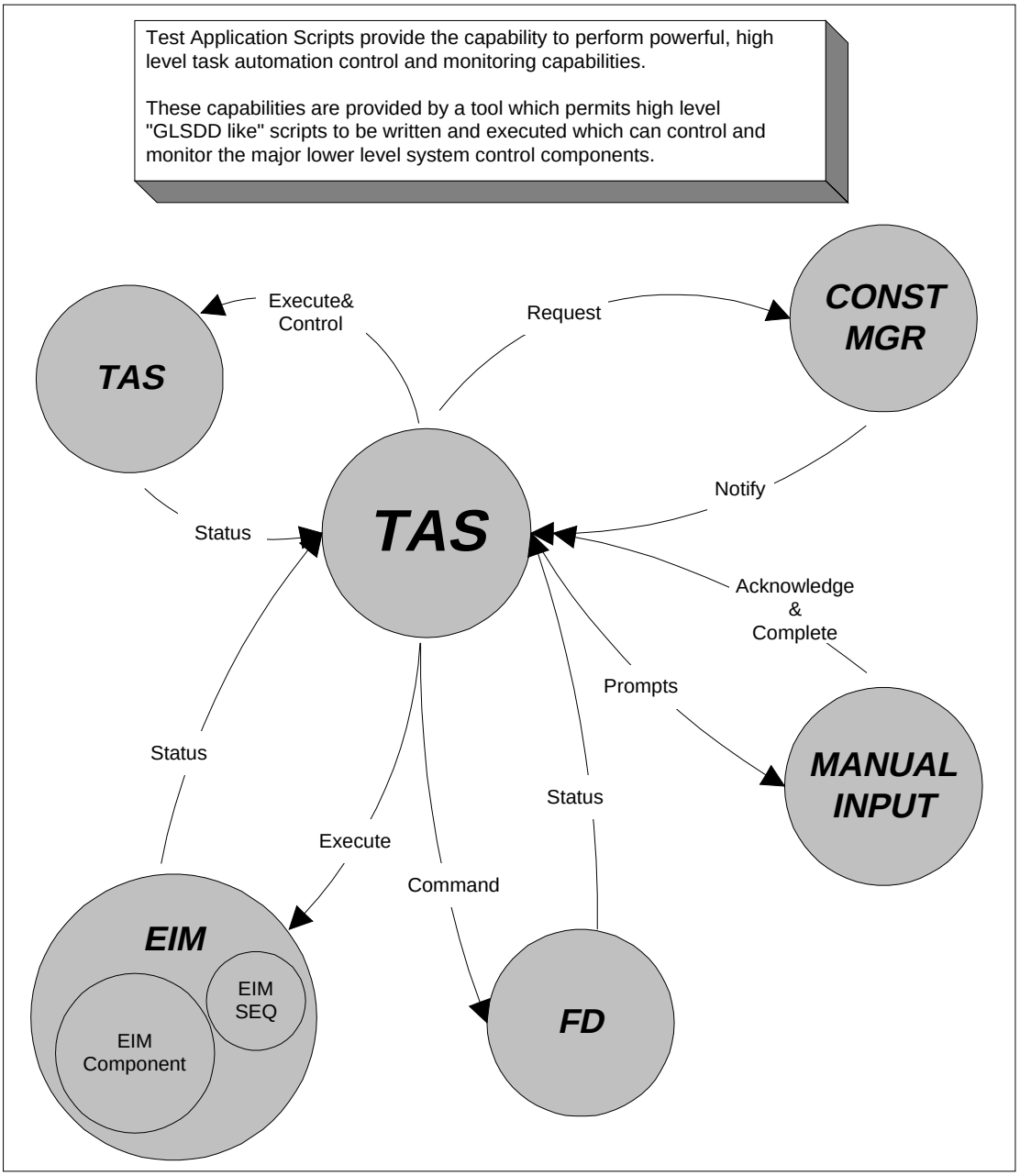
TAS will fill the system test and checkout automation gaps that exist between the EIM Sequencers and Command Processor Scripts capabilities. Using a high level of abstraction, the TAS editor will be designed so GLSDD style scripts can be written to provide the following level of control:

1. Execute and monitor another TAS.
2. Execute and monitor EIM Services, including EIM Sequencers.
3. Execute and monitor Contraint Manager Services.
4. Manual operator request and acknowledgement.
5. Conditional execution of steps based on constraint state, FD state or service component execution status (e.g., FD, EIM, TAS)
6. Command and test FDs.

As a TAS executes, its status is communicated through a standard set of FDs that are unique for each TAS. The execution of a TAS can be monitored through these FDs by one or more TAS Viewers in the RTPS and in the office. Individual TAS FD change data is logged and is available from the SDC for TAS execution verification by retrieval of TAS "As Run" reports.

The following functional flow, software architecture, and prototype TAS viewer GUI diagrams are provided for concept definition clarity.

Test Application Script Pathfinder - System Design Concept



Test Application Script Pathfinder - Software Architecture Concept

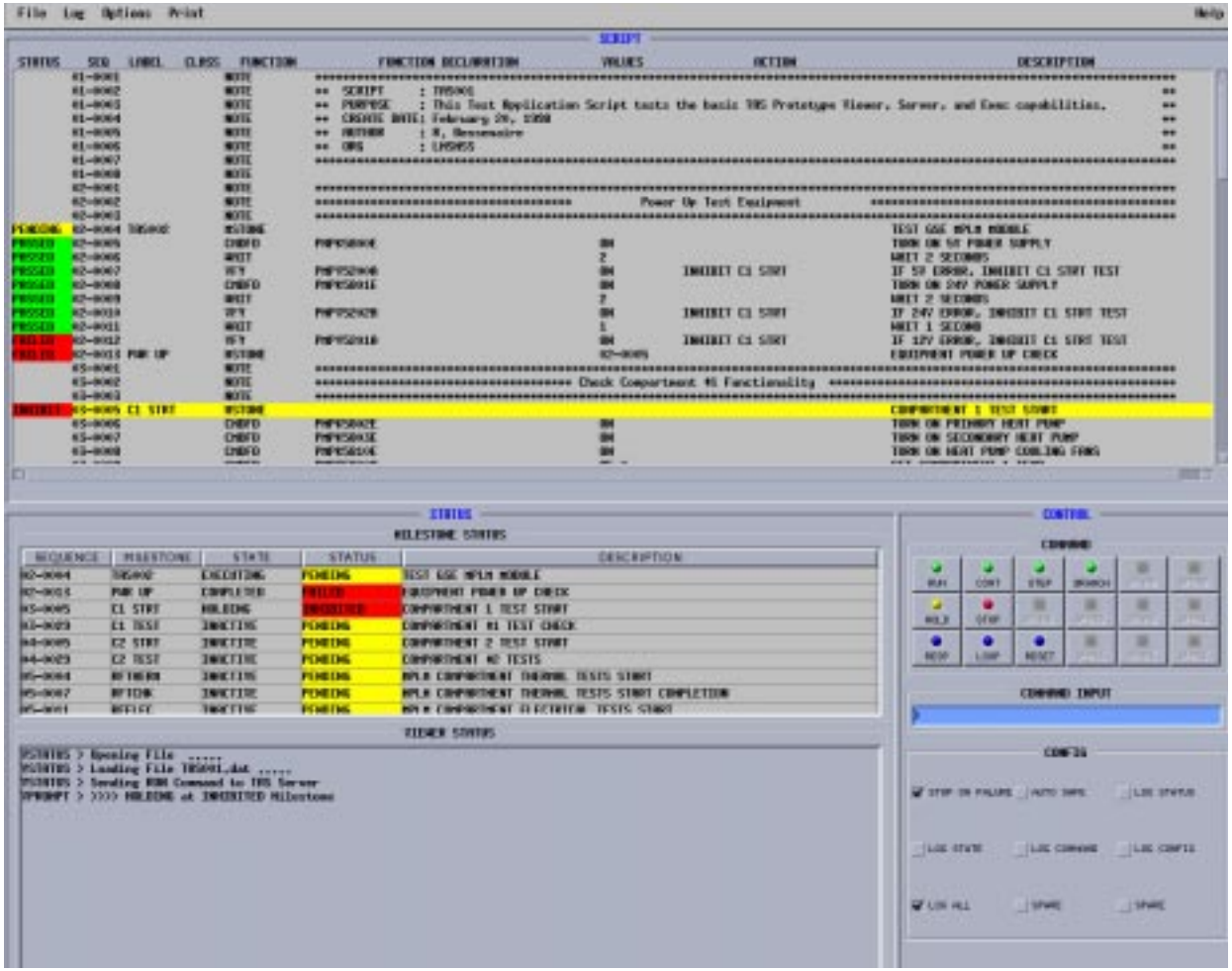
Error! No topic specified.

Test Application Script Pathfinder - High Level GUI Abstraction Concept

Error! No topic specified.

The Operator can view the TAS execution at a high level. The operator can select a more detailed view of a particular TAS by selecting the TAS icon.

Test Application Script Pathfinder - Low Level GUI Abstraction Concept



1.3 Test Application Script Pathfinder Specification

1.3.1 Statement of Work

- Define Test Application Script function required for CLCS considering these factors:
    - Capability of issuing commands to End-Item Managers.
    - Capability of issuing FD commands.
    - Capability of reading, testing, and displaying FD's.
    - Capability of initiating other Test Application Scripts.
    - Capability to accept direct engineering input to confirm completion of manual operations.
    - Capability to monitor test application Script progress with a viewer
    - Capability to hold, run, step, and set breakpoints for execution control.
    - Capability to print completion status of each script step to a file.
- Determine if a COTS tool or re-use can be utilized.

1.3.2 Requirements

This section represents the requirements of the TAS tool and methodology to be selected, not requirements of the pathfinder for the purposes of sell-off.

(SLS 2.2.5.7.1) The Test Application Script function provides a capability to define a sequence of events required for a given test.

(SLS 2.2.5.7.2) CLCS shall provide a Test Application Script function for user test sequences.

(SLS 2.2.5.7.3) The RTPS Test Application Script function shall provide the capability to automatically execute a sequence to safe the item under test when a RTPS system fault occurs.

(SLS 2.2.5.7.4) The RTPS Test Application Script function shall provide the capability to continue, if commanded, after an automatic sequence to safe the item under test has occurred.

(SLS 2.2.5.7.5) RTPS shall utilize Constraint Management for constraint monitoring for a Test Application Script.

(SLS 2.2.5.7.6) Test Application Scripts shall be capable of issuing commands to End-Item Managers.

(SLS 2.2.5.7.7) Test Application Scripts shall be capable of initiating other Test Application Scripts.

(SLS 2.2.5.7.8) Test Application Scripts shall provide the capability to automate operations within an End-Item System.

(SLS 2.2.5.7.9) Test Application Scripts shall provide the capability to automate integrated operations involving multiple End-Item Systems.

(SLS 2.2.5.7.10) Test Application Scripts shall provide the capability to accept direct engineering input to confirm completion of manual operations.

(SLS 2.2.5.7.11) Test Application Scripts shall provide the capability to allow multiple users to monitor Test Application Script execution.

(SLS 2.2.5.7.12) Test Application Scripts shall be implemented in a manner that is clearly understandable and usable by system engineering and test management personnel and analogous to printed test procedures.

(SLS 2.2.5.7.13) Test Application Scripts shall provide the capability to layer/encapsulate an End-Item System, allowing maintenance in a single place and reuse throughout user applications.

1.4 Test Application Script Pathfinder Hardware Diagram

Not Applicable.

1.5 Test Application Script Pathfinder Deliverables

Report and Recommendation [DP1(d)].

1.6 Test Application Script Pathfinder Assessment Summary

1.6.1 Labor Assessments

The total Labor Costs required to provide this capability are summarized in the following table;

No.	CSCI/HWCI Name	Thor LM	Changes covered in

1.6.2 Hardware Costs

None.

1.6.3 Test Application Script Pathfinder Procurement

None.

1.7 Test Application Script Pathfinder Schedule & Dependencies

1.7.1 Schedule

Task Name	**Start**	**Finish**
Thor Assessment Kickoff	7/5/97	
Concept(a) Panel Internal Review	9/2/97	
Concept(a) Panel	9/4/97	
Concept(b) Panel Internal Review	10/7/97	
Concept(b) Panel	10/9/97	
Concept(c) Panel Internal Review	11/4/97	
Concept(c) Panel	11/6/97	
Prepare Report	11/24/97	
Concept(d) Panel and Presentation of Report Internal Review	02/27/98	02/27/98
Concept(d) Panel and Presentation of Report	02/2798	02/27/98
Thor Pathfinder Complete	02/27/98	02/27/98

1.7.2 Dependencies

None.

1.8 Test Application Script Pathfinder Simulation Requirements

Unknown.

1.9 Test Application Script Pathfinder Integration and System Test

Not applicable.

1.10 Test Application Script Pathfinder Training Requirements

1.10.1 Training Needed

None.

1.10.2 Training to be provided

None.

1.11 Test Application Script Pathfinder Facilities Requirements

None.

1.12 Travel Requirements

None.

1.13 Test Application Script Pathfinder Action Items/Resolution

To be recorded.

2. CSCI Assessments

None.

3. HWCI Assessments

None.

4. COTS Products Dependencies

4.1 SW Products Dependency List

None.

4.2 HW Products Dependency List

Product Name	Quantity Needed	Need Date